

Exploring Indigenous Innovations;
Ascertaining the Scope for Design Interventions
for their Successful Commercialization

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Aims & Objectives of the study:

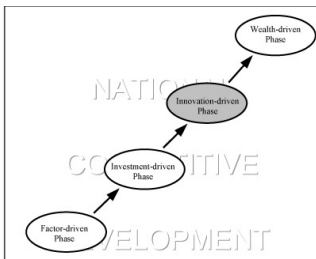
- To understand the characteristics of innovations
- To understand the characteristics of indigenous innovations
- To examine scope and potential of Indigenous Innovations as tools for social and economic development
- To study intervention efforts for Indigenous Innovations, being carried out elsewhere/globally.
- To ascertain scope for design intervention in the process of indigenous innovation and their conversion to marketable products/solutions.
- To attempt to develop interventions model/ direction/ guidelines appropriate to Indian context.

Hypothesis:

- Indigenous Innovations hold great potential, as driver of social and economic development for the developing countries like India.
- Systematic and contextual interventions can considerably enhance the rate of success of indigenous innovations
- Design is a vital constituent of the process of indigenous innovations, especially for their transition to markets.

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Innovation – a necessity



'Get Innovative or Get Dead',
Tom Peters,

'Technological progress and innovation is the greatest engine of economic growth.'

Robert Solow, Growth Theory,
Nobel Memorial Prize in Economic
Science, 1987

'If a country aspires to become a developed nation, it must transit to the innovation-driven category.'

- Michael Porter, 'The Competitive Advantage of Nations'

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Innovation – a necessity

1970's	Time	Quality	Cost
1980's	Time	Quality	Cost
1990's	Time	Quality	Cost
Future	Innovation		

'Every organization – not just business – needs one core competence: innovation.'

- Peter Drucker

'Innovation fuels organizational growth, drives future success, and is the engine that allows business to sustain their viability in a competitive global economy.'

- Gerard H. Gaynor, Innovation by Design

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Creativity

"...a process of developing and expressing novel ideas that are likely to be useful"

Such a definition emphasizes not only the new, novel and unusual, but also 'useful' characteristics of the 'creative activity,' which leads to the potential for utility.

Discovery

We discover what before existed, though to us unknown; we invent what did not exist before.

Invention

Invention is the creation of a new concept.

Innovation

Innovation = Invention + Implementation / Commercialization

Design

Design is the professional capability of creating and developing concepts and realising them into products and systems for the mutual benefit of both user and manufacturer.

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Characteristics of Innovation

Innovation = Invention + Implementation / Commercialization

- Innovation is creating new ideas and getting them to work.
- Innovation is not science or technology
- Innovation creates new wealth rather than knowledge.
- Innovation is turning an idea into a business success
- Innovation must be user-focused
- Innovation is newness in the sense of not having been done before but with a little bit of slack.
- Innovation is often an effect of the small incremental/ marginal changes in the product or process.

Categories of Innovation:

- Top-down or Bottom-up innovations
 - incremental innovations - improvements to current products, processes, services and systems;
 - new-to-the-market/society innovations - new products, processes, services, and systems;
 - breakthrough Innovations - set the stage for the future and turn into the moments in history.

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Changing market trends

- Globalization
 - Borderless business competition
 - Saturated Markets
- Rapid Technological Breakthroughs
 - Reduced Product Lifecycle
- Information Technology Integration
- Increased awareness of Ecological and Sustainability issues
 - Scarcity of materials
 - Increasing cost of energy and transportation
- Stringent IPR
- Mass-customization
- Demand for original Solutions
- Focus on 'quality of life'

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Indigenous Innovations – a way ahead

- By the turn of the millennium, governments practically everywhere in the advanced economies were promoting **regional innovation and cluster-building** policies as ways of boosting national competitiveness. - www.unido.org
- United States' competitive lead in innovation was predicated by Michael Porter, on the existence of **regional and local innovation** systems based on clusters. -, - www.unido.org
- China's 15 year plan "National Medium- and Long-Term Program for Scientific and Technological Development", for expanding its capacity to create "indigenous innovations" to advance into the ranks of innovative countries by 2020.
 - to stimulate cutting-edge indigenous innovations, so as to reduce its dependence on foreign technology,
 - to foster smaller, entrepreneurial companies, as they are largely the drivers of innovation.
- Indigenous innovations can aid developing nations embark on a cumulative path of positive growth; thereby help them join the ranks of the more advanced nations.

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Indigenous Innovations & India

'Indians by nature are highly enterprising and they find ingenious and amazing ways to make the most of whatever resources and skills at their disposal to earn their daily living. ...Design is the way of life in India.'

- Rich tradition of over 5000 year old civilization,
- Infinite treasure of indigenous knowledge and practiced wisdom
- Primarily an agrarian and service economy,
- Over seventy percent rural population,
- Crafts and SMEs as the main industry sectors,
- Large middle income and rural segment,

'One style of innovation that really works in a country as large and diverse as ours, is grassroots innovations: this includes inventions for a milieu that is quintessentially Indian. ... they are critical to how Indian ingenuity can be directly used to transform our circumstances, in ways that elite corporate research laboratories never can' - Arindam Banerji

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Indigenous Innovations & India

- These solution/s could be in the form of
 - non-conventional use of a given product,
 - local improvisation / modification with scope of replication,
 - new application of the product / materials,
 - combination of traditional skills and the contemporary needs and markets,
 - a foreign technology/ solution modified / value added to suit the local context,
 - a completely new innovation.
- It is generally carried out
 - to add value,
 - to increase the life cycle or usage of the available resources and/or products,
 - to reuse or recycle the available product/ materials,
 - to create new opportunities
 - to improve the quality of life of the people involved.
- By their very nature of development, these solutions/ ideas would have inbuilt considerations of many of its ecological, cultural, and sustainability aspects of design.

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Significance of Indigenous innovations

- best solutions for the local problems.
- utilizes the indigenous knowledge and existing resources available
- generates new employment opportunities,
- foster self-confidence and self-respect amongst the community, leading to economic growth and social change in the community.
- encourage local self-reliance, decentralization of decision-making and fair access to natural resources.
- As these solutions emerge from the local context, they will be more likely to be accepted by the community.
- create positive attitude towards life and its challenges, thereby help safeguard the community morale.
- capacitate the innovators and thus the community against external threats

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Significance of Indigenous Innovations

- Value of Indigenous knowledge is now being recognized in the last ten years
- Approx. 80% of the world's population, it is estimated, relies on Indigenous Knowledge for either medicine or food.
- Indigenous knowledge fuels multi-billion dollar genetics supply industries.
- Indigenous knowledge is a powerful resource of rural people and therefore a key element in the fight against poverty and social exclusion for many rural communities worldwide.
- Local innovations as evolving alternatives to development.
- It is often the case that, indigenous innovations are environmentally friendly and sustainable when compared with scientific innovations.

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Need for a Global – Local Approach

- A Local person's idea of a successful solution may be very different from a western scientist's idea of success.
- Indigenous knowledge, along with western-based knowledge, helps create development solutions that are culturally acceptable to the society being helped.
- The two systems of knowledge - Western and Traditional, to effectively contribute to the betterment of living conditions through innovations, they both need to gain equal recognition on the platform of creativity and knowledge transfer.
- To make innovations and technology transfer efficient, effective and also sustainable and accessible to all, they need to be considered within the context of the language, culture and other Indigenous Knowledge Systems (IKS).

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Need for a Global – Local Approach

- Sustainable innovation and technology transfer are possible only if there is a bi-directional sharing rather than a unidirectional process.
- Need for making the development agendas more farmers or user-led based on local knowledge and skills.
- Need for participatory approach
 - facilitate the process of linking scientific knowledge with local knowledge,
 - create an enabling environment.
 - self-organized planning, systematic implementation, experimentations
- Analyzing local innovations provides a focus for groups/communities to examine opportunities and set agenda for R&D

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Characteristics of Indigenous Innovation

- Indigenous
 - 'indigenous' was equivalent to 'local', 'folk', 'rural', 'grassroots', 'anti-western', the one based with minority, etc.
 - the dictionary meanings - 'native', 'original', 'home-grown' etc.,
- Indigenous Knowledge
 - ingrained into the culture
 - exists largely in the tacit form.
 - difficult to explain through formal language.
 - probably the oldest system of knowledge
 - generally remained constrained within the community / region.
 - different at different locations and with different people.
- Innovator
 - part of the same community facing the problem / necessity for new solutions.
 - personal initiatives and commitments, in terms of time, resources including finance, and also the risks involved.
 - solutions dependent on the experience, expertise, exposure and enthusiasm of the innovator/s.

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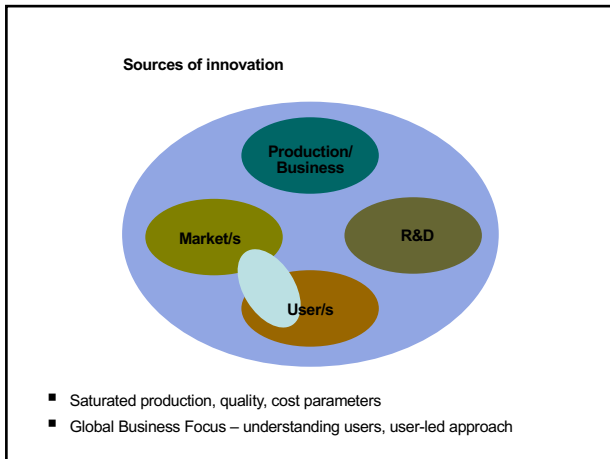
Characteristics of Indigenous Innovation

Indigenous Innovations

'New ideas based on local resources evolved through the experimentation of local people to address the specific local constraints and opportunities.'
'Independent, self-reliant, and indigenous'

- primarily based in the local context.
- developed mostly through informal, unorganized and experimental basis,
 - developed by individual/s interested/ affected and from the same community.
- solutions evolved largely for necessity and not for any business purpose,
 - they will have inherent weakness, in terms of their replication, production and/or commercialization.
- limitations in terms of their migration from one culture or tradition to new environment.
- Within the context / boundary, these solutions will be most effective, both in terms of their suitability as well as sustainability.

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Organizational Innovations	Indigenous Innovations
<ul style="list-style-type: none"> ▪ Team work ▪ Formal, organized, group efforts ▪ Largely top-down ▪ Finance organized, risks shared ▪ Departmental approach/ Shared responsibilities ▪ Specific resources, infrastructure, time allocated for project/s ▪ Expertise, experience, exposure available ▪ Networked marketing efforts ▪ Systematic methodology, drawings, models, prototypes, etc. used to reduce development time, finance and risks 	<ul style="list-style-type: none"> ▪ Isolated / Individual ▪ Informal, unorganized, individual efforts ▪ Mostly bottom-up ▪ Own risks, finance ▪ Total responsibilities on individual ▪ Personal, limited resources, infrastructure and time ▪ Largely based on personal experience, expertise and exposure ▪ No markets and/or networks arranged ▪ Slow process, consumes resources and finance. Prototypes built at every stages.

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Organizational Innovations	Indigenous Innovations
<ul style="list-style-type: none"> ▪ Passive user, foreign situation ▪ Low on empathy, experience and understanding of ground reality/ problems ▪ Foreign solutions, adjusted to local needs ▪ Foreign industry – skills, resources & employment ▪ Dependent on outside knowledge, resources ▪ Organized, Generated in industry/ R&D Centers/ Labs/ institutes 	<ul style="list-style-type: none"> ▪ Active user, local situation ▪ Empathy, understanding/ experience of problem/ situation/ need ▪ Solutions evolved based on local need ▪ Local skills, resources utilized, employment generated locally ▪ Local knowledge utilized to solve local problems – confidence, self-reliance ▪ Largely scattered, evolves/ generates in the field

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Interventions for Indigenous Innovations
<ul style="list-style-type: none"> ▪ To convert indigenous innovations/ ideas into commercially viable solutions/enterprises <ul style="list-style-type: none"> ▪ Identification, Documentation ▪ Protection ▪ Promotion, Dissemination ▪ Developments ▪ Hand-holding/ Incubation Support ▪ provide platform for sharing and exchange of knowledge, information and idea/innovation, ▪ peer-to-peer learning, ▪ collaborations and network with various experts and supporters. ▪ raise awareness amongst the community, ▪ safeguard the interests of these innovators and the community. ▪ platform for collaborations, partnerships for further development <p>'Best Practices Using Indigenous Knowledge', Nuffic & UNESCO www.worldbank.org/afri/ikdb PROLINNOVA PFI Project ISWC Project National Innovation Foundation, NIF Rural Innovation Network, RIN, Kerala Grassroots Innovation Augmentation Network, GIAN, Ahmedabad</p>

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Interventions for Indigenous Innovations

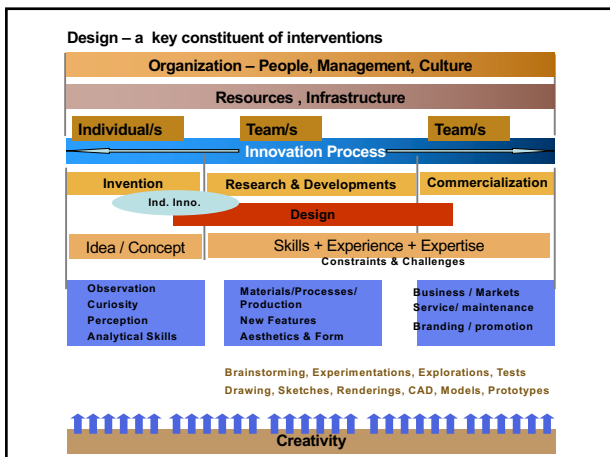
- Present Focus – commercialization, Business
 - Documentation and protection of innovations
 - Marketing – to carry out initial market research to understand market and business potential, and/or for marketing of the new products;
 - Planning and Management of resources, finance;
 - Interface with government, academia, industry etc.,
 - Coordination, networking and hand-holding
 - Technology – product refinements, modifications, product testing and production/replication;
 - Capacity building through training and exposure, etc.
 - Promotion and dissemination of innovation and knowledge to larger audience,
- Largely scattered efforts

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Criteria for selection of Indigenous innovation

- Important
 - Technically feasible, Economically viable, Environment friendly and socially acceptable (TEES test)
 - Locally evolved/developed using local knowledge and skills
 - Address immediate or long term solution or opportunities (potential benefits)
 - Widely replicable
 - Interest and consent of innovators
- Desirable
 - Adaptability (how easily can it be used/ modified)
 - Use of easily available/accessible local resources
 - Low cost in terms of affordability
 - Cost effectiveness in terms of time and resources
- The supporting interventions can be of the following nature:
 - Value addition or modification to the existing technologies or processes (Innovation)
 - Financial incentives for its further modification or replication
 - Capacity building (technical backstopping, training, resources support)
 - Establishing sustainable linkages with relevant stakeholders
 - Policy influence
 - Setting up support funds for Innovation on a community
 - Exposure to larger audience

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Design – a key constituent of interventions

- Design is now recognized as a core of the innovation process (Freeman, 1982; OECD, 1992).
- As an indispensable part of any business success, design has today moved to that of an integrating and guiding intelligence within the innovation process.
- Design is the central factor of innovative humanisation of technologies and the crucial factor of cultural and economic exchange. www.icsid.org
- Design is the professional capability of creating and developing concepts and realising them into products and systems for the mutual benefit of both user and manufacturer. www.nid.edu

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Role of Design/er

- Bringing Order
- Giving form to idea
- Synthesizing, integrating efforts
- Evaluation & refinement of idea/content/concept
- Systems approach
- Connecting production constraints to user aspirations

Design is about doing things consciously, not because they have always been done in a certain way or because it is the easiest option.

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Characteristics of Successful Indigenous Innovations

- Innovations that become permanent local knowledge often have several common features.
 - reduces risk
 - generates income
 - is affordable
 - is readily available
 - saves labor
 - fits into current practices
 - is easy to understand
 - produces readily visible results within a reasonable amount of time
 - meets multiple needs
 - is attested by evidence from several sources, including those most trusted in the community
 - take into consideration things such as taste preferences, and nutritional beliefs
- when an innovation has parallels with indigenous practices, there is often widespread acceptance of the innovation.

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Design Interventions for Indigenous Innovations – a Case study

Redesign of Bullock-Cart

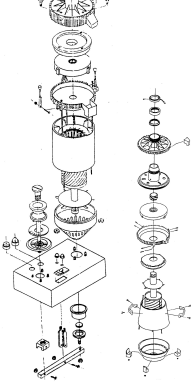


Benefits of Design Intervention:

- Cost brought down to fit into price segment
- Functional simplicity
- Fabrication systemized & simplified
- Reduced exploration time and efforts
- Resources optimized

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Design Interventions for Indigenous Innovations – a Case study



Benefits of Design Intervention:

- Production simplified
- Better utilization of resources
- Reduced nos. of components
 - Multi-functionality
- Improved quality and finish



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Design Interventions for Indigenous Innovations – a Case study

Design of CO2 Laser Surgical System



Benefits of Design Intervention:

- Functional simplicity
 - Value addition
- Product indigenization

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Conclusions

- Indigenous Innovations
 - User focused - evolved based on user need
 - Provides Originality
 - Cultural integration
 - Optimum utilization of resources, skills
 - Generates opportunities, employment at local level
- Good Potential for its commercialization
 - Potential for success high, in this era of mass-customization, original solutions
 - Tool for social and economic development
 - Rich resource of indigenous innovations
 - Offers future direction for the country to transit into innovation-driven economy
- Largely Bottom-up innovations
 - Needs further intervention efforts
 - Local + Global approach to integrate indigenous knowledge with scientific knowledge

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Conclusions

- Need for Organized, systematic (also planned), institutionalized efforts
- Need for policy
- Cluster based, participatory approach
- Encourage innovation, innovative attitude
- Reward ideas
- Cataloging, idea bank - feasibility study / technical information
- Incubators / hand holding supports
- Resources, infrastructure available
- Team efforts – innovator at the center of the team, encourage collaborations, partnerships, team synergy
- Ready network – experience, expertise,
- Shared responsibilities and risks
- Systems thinking, holistic vision
- Refine ideas/ value addition
- User focus, empathetic understanding, focus on quality
- Sketches/ drawing/ models – for better communication, reduced time, efforts and resources
- Encourage experimentations, explorations, prototyping, testing
- Design Clinics

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Thank You !!

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